

## **FY04 Goals - Icing Research Tunnel boot replacement**

The Icing Research Tunnel (IRT) at NASA Glenn Research Center was built at the end of World War II in order to develop and test ice protection systems for aircraft. A propeller contains seven foot spruce blades with a basswood tip. On the leading edge of each blade is an estane rubber boot, for protection. Unfortunately, accidents happen, such as when a worker left a ladder in the Tunnel. When the propeller was started, the intake pulled the ladder into the blades. Not only was the ladder chopped into pieces, some rubber boots were left in shreds.

Boot removal had been performed in the past using MEK (methyl ethyl ketone). As the Environmentally Preferable Purchasing (EPP) program kicked in, alternatives were selected for testing. Several products were tested, with no success. In the meantime, Goodrich changed the way the boots fastened onto the blades, using a self-stick type of glue. When the time came to remove a new boot for the first time, what began as an EPP project became a desperate situation, as the MEK failed to remove the glue.

One of the products Goodrich had suggested to remove the glue was Peerco 321, an 80% citrus oil product. Of about nine products tested, only the Peerco 321 performed well. The best news is that a biobased, recycled-content product with very low health risk (skin irritation, with possible sensitization without gloves) turned out to be the best performer.

The Icing Tunnel has the ordering information and will be using this product from now on.